

Cost-Effectiveness of a Nurse Practitioner-Led Care Transition Intervention

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Objective

To examine the cost-effectiveness of a Nurse Practitioner (NP)-led care transition intervention at reducing 30-day readmissions among high-risk acute care discharges.

Why care transitions?

- Older adults with multiple morbidities are at high risk of hospital readmission within the first 30-days post-discharge¹
- Readmissions are very costly² and (may) indicate decreased quality care³
- Interventions that coordinate care transitions from hospital to home reduce 30-day readmissions^{4,5}
- The impact of care transitions on hospital readmissions has not been studied in the Ontario context

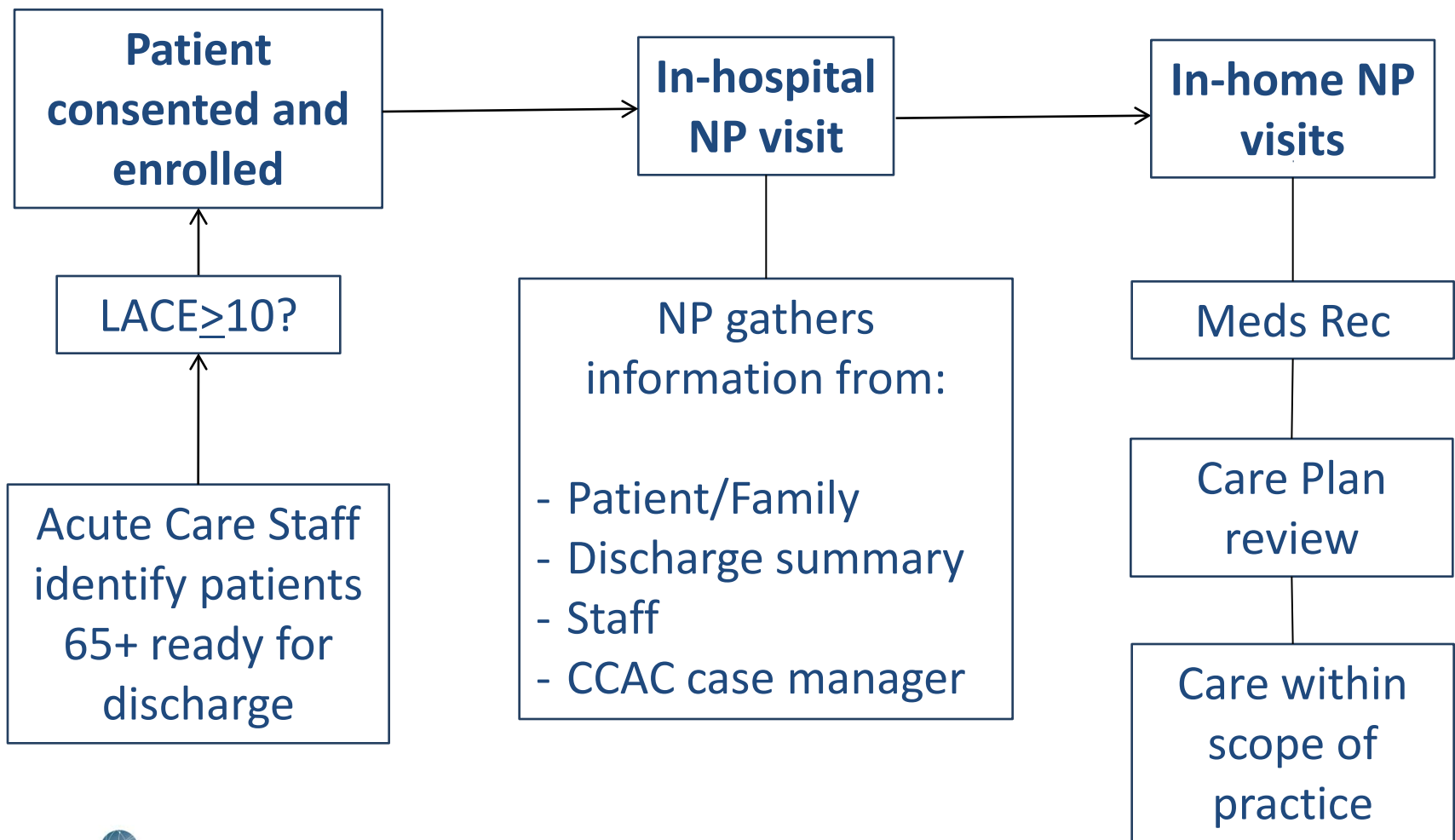
1. Jenks et al. *N Engl J Med*. 2009;360(14):1418-28. 2. Graves et al. *Plos ONE*. 2009;4(10):e7455. 3. Ashton et al. *Med Care*. 1997;35(10):1044-59. 4. Naylor et al. *J Am Med Assoc*. 1999;281(7):613-20. 5. Coleman et al. *Arch Intern Med*. 2006;166(17):1822-8.

Methods

Study Setting

- London, Ontario (population >350,000)
- Medical wards of two tertiary care hospitals associated with Western University
- Patients screened from October 2010 to March 2011

The Intervention



Control Cohort

- Patients from same hospital, October 2008 to December 2009, retrospectively matched to intervention cohort by:
 - Age (+/- 3 years)
 - Sex
 - LACE score
 - Season of index admission (Nov – Apr. vs. May – October)
 - Patient complexity level

Data Analysis

- Incremental cost-effectiveness ratio

$$\frac{\Delta \text{ costs}}{\Delta \text{ readmissions}}$$

Findings

Sample Characteristics

Patient Characteristics at Index Admission	Intervention (n = 70)	Control (n = 70)	Standardized Mean Difference
Age (Mean \pm SD)	80.57 \pm 6.51	80.47 \pm 6.60	0.02
Females	43 (61.4%)	43 (61.4%)	0
LACE Score [Median (IQR)]	12 (10-13)	12 (10-13)	0
Admitted from Nov. 1 – Apr. 30	40 (57.1%)	40 (57.1%)	0
Length of Stay (Mean \pm SD)	12.53 \pm 9.54	13.89 \pm 15.72	0.1

Sample Characteristics

Patient Characteristics at Index Admission	Intervention (n = 70)	Control (n = 70)	Standardized Mean Difference
Past year # of Primary care visits [Median (IQR)]	8 (5-12)	10 (5-14)	0.19
Past year # of Specialist visits [Median (IQR)]	5 (2-9)	4 (1-8)	0.14
Past year # of ED visits [Median (IQR)]	3 (2-5)	2 (1-3)	0.59
Home care, past year	53 (75.7%)	38 (54.3%)	0.46
Elective Admission	0 (0.0%)	<=5 (4.3%)	0.3
Urgent Admission	70 (100.0%)	67 (95.7%)	0.3

Intervention Costs

Intervention Activity	Total Cost for <u>All</u> Patients at 30 days
LACE screening in hospital (15 minutes by RN)	\$806
NP visits (in hospital and home)	\$5,523
NP mileage	\$1,010
Medication Reconciliation	\$3,500
Total 30-day Intervention Costs	\$10,839

ICER for 30-day readmissions

	Intervention	Control	Δ (Intervention – Control)
30-day costs (\$)	332,896 + 10,839 = 343,735	322,989	\$20,746
30-day readmission count	20 (28%)	18 (26%)	2

$$\text{ICER} = (20,746)/(2) = 10,373$$

ICER for 30-day readmissions

For every additional \$10,373 invested in the NP-led care transition intervention, **two additional readmissions occurred** at 30 days post-discharge.

Conclusion

A nurse practitioner-led care transition program is not cost-effective in an Ontario setting for reducing 30-day readmissions among high risk seniors identified with the LACE tool.

Discussion

- Study underpowered to detect significant differences in readmissions between groups
- The intervention was not delivered as intended

8. Kansagara, et al. 2011. *JAMA*;306(15):1688-98. 9. van Walraven, et al. 2012. *Open Medicine*;6(2):1-11.

Thank you

Questions and comments are welcome.

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LACE Screening Tool

Length of stay (during index hospitalization)

Acuity on admission (acute vs. non-acute)

Comorbidity (updated Charlson score)^{5,6}

Emergency department visits (in 6 months pre-index admission)

- LACE Index validated using admin data from 1 million Ontarians discharged 2004-2008⁷

5. Charlson, et al. 1987. *J Chronic Dis*, 40(5), 373-83. 6. Schneeweiss, et al. 2003. *Health Serv Res*, 38(4), 1103-20.
7. Grunier et al. *Open Medicine*. 2011;5(2):104-11.

Data Sources

- Patient-level data collected by Nurse Practitioner and Research Assistant
- Institute for Clinical Evaluative Sciences
 - Discharge Abstracts Database
 - OHIP Billings:
 - Acute Care Claims
 - National Ambulatory Care Reporting System
 - Cost macro

Comorbidity Level

- **0**—No comorbidity
- **1**—Comorbidity level 1: from 1.25 to 1.5 times more resource intensive
- **2**—Comorbidity level 2: from 1.5 to 2 times more resource intensive
- **3**—Comorbidity level 3: from 2 to 3 times more resource intensive
- **4**—Comorbidity level 4: 3 or greater times more resource intensive
- **8**—Comorbidity level not applicable (only for a small number of CMGs)